brief descriptions will help. Instead of technical descriptions there are interesting notes on the biology and ecology of the species, their use by the Indians, their relation to birds, insects and other desert animals. The meanings of the scientific names are given and the English or common names are given, or, in the majority of cases, as the plants have no common name, one is supplied, often an English form or translation of the scientific one. To the reviewer this seems unnecessary. Anyone who can distinguish between the species can learn the scientific name as easily as the manufactured "common" one.

As an example of the treatment of species we select one of the fourteen species of Saltbush, *Atriplex Torreyi* (Gr. "not" + "to nourish"—because it robs the soil, also the Latin name for "orache"; John Torrey). "Principally a Nevada species extending southeast to the Mohave Desert of California and east to southwestern Utah. The gray-scurfy branches and sharply angled twigs make up large, almost impenetrable bushes 3-6 ft. tall. . . . Dr. John Torrey, a New York botanist, specialist in mosses, in whose honor Sereno Watson named this plant, was the describer of many of the species collected by Frémont in western deserts. He visited California in 1865, collecting in the region about Santa Barbara and in the Sierra Nevada." In the same way biographical notes are given for 150 others whose names are commemorated in genus or species names.

The scientific names used (without citation of authority or synonyms) are "for the most part those used by Munz in his Manual of Southern California Botany," which means that Dr. Jaeger is conservative in his ideas as to genera and species.

The volume is attractive and admirably adapted to its purpose of a popular handbook of desert plants. The professional botanist will find it a desirable supplement to the standard manuals with much of interest about the plants omitted from these more technical works.

What Are the Vitamins?

What Are the Vitamins? Eddy, Walter H., Reinhold Publishing Corporation. 1941. 247 p. $2.50.

Wm. J. Bonisteel

Thirty years ago Funk discovered a crystalline substance in extracts from rice polishings and the story of vitamins was launched.

Even prior to this date scientific workers clearly indicated that factors were present in food other than carbohydrates, fats and proteins. Within the last five years interest in vitamins has become widespread and the general public have many questions that they want answered. The book by Dr. Eddy, long a worker in vitamin research, answers these questions in a straightforward manner. Scientific accuracy has been maintained throughout the volume.

Vitamins are intimately tied up with plants for in nature these organic chemical compounds occur in natural foodstuffs. The advance in vitamin knowledge occurred when these substances were isolated in pure form and their chemical structure determined. With definite chemical entities science could determine their function and rôle in living organisms. Many of these substances have been made synthetically in the laboratories. Twelve vitamins have been chemically identified and their functions clearly demonstrated.

The author indicates the method of naming the vitamins and explains their chemical nature in a carefully selected appendix. The information about vitamins is understandable to one who may not have a great deal of technical knowledge. Throughout the book the painstaking research that was necessary to bring order out of chaos is vividly described.

A considerable number of vitamins have been postulated on the physiological reactions that they show. These substances have not as yet been isolated or determined chemically. Included in this group are the anti-grey hair factor, Centanni's digestive factor, the grass juice factor and about a dozen other factors. Their rôle in human economy can only await the results of further research.

For proof of vitamin activity one only has to compare a picture of a group of school children of 1900 and 1940. It is clearly established that certain vitamins must be present in food or given otherwise if we are to prevent rickets, scurvy, pellagra and other existing deficiencies. Certain facts are still lacking on how the vitamins are able to protect an individual from these conditions. In one chapter the relation of certain of the vitamins to intracellular respiratory enzymes is introduced. The processes of oxidation, hydrogen carriers, coenzymes, cytochromes and carboxylases are explained so as to give one an idea of how some of the vitamins function in cellular activity.

The general treatment in the book is to consider each of the well-known vitamins separately. Their occurrence in foodstuffs is listed and in the appendix the distribution of each vitamin in foods is tabulated. The properties of the vitamins is given in considerable detail. This is a very valuable part of the book for it gives the basis of the experiments conducted, the findings and in many cases charts and formulas are used for brevity.

The human need for each vitamin is given. Each chapter is concluded with a short but carefully selected bibliography for those who wish more details. The literature in the field is very extensive and the choice of titles used is excellent. The lesser known vitamins are considered in the light of their present knowledge.

The tables with vitamin values are useful. Each foodstuff is tabulated in terms on International Units (their equivalents are given elsewhere in the book) or in micrograms in the case of riboflavin. Another distinct advance is listing the materials as average portions served. The equivalent weight in ounces and grams permit all to use the tables. Each portion is then listed with the vitamin unit that is given by that food portion. Any one can use this information in the preparation of diets. One must not be unmindful of the fact that soil conditions, methods of marketing and various processes used in preparing foods may affect vitamin values. The tables are based upon average expectancies under normal conditions.

Given the proper carbohydrates, fats, proteins, vitamins and minerals every organism can carry on at its maximum efficiency. Deprive that organism, whether man or fungi, of the necessary elements and you have a deficiency condition that lowers its potential effectiveness against disease. Vitamins are essential in preventive medicine and health. Certainly in courses of botany vitamins deserve more attention than they now receive. Teacher, student, housewife, and general reader may learn much from this volume. The author has given the best summation yet published. The publishers have given an easily read book. Both have made a real contribution to a fuller understanding of the vitamin problem.